
Name of Organization: University of Wisconsin-Madison

Type of Organization: College or University

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Project Title: Decision Framework and Tool for Sediment Remediation

Project Category: Contaminated Sediments

Rank by Organization (if applicable): 0

Total Funding Requested (\$): 263,618 **Project Duration:** 2 Years

Abstract:

Extend, validate, and put into use a decision framework with methods, software and training for estimating the costs and economic benefits of cleaning up contaminated sediments. The intent of this work is to help speed up and resolve decisions about remediating contaminated sediments in Great Lakes Areas of Concern (AOCs). The environmental outcome of this project should be more sediment projects completed, and completed faster than if the tools and training are not provided. The project will extend and complement work done on a project funded in 1995-1997 by the USEPA-GLNPO, the Great Lakes Protection Fund, and the University of Wisconsin Sea Grant Program. This request follows 14 basin-wide demonstrations of the REMSIM (REMediation SIMulation) software created on the earlier project. Evaluations from the demonstrations indicate a need for the decision framework and software by engineering firms and resource managers who plan and manage remediation.

Geographic Areas Affected by the Project

States:

<input checked="" type="checkbox"/> Illinois	<input checked="" type="checkbox"/> New York
<input type="checkbox"/> Indiana	<input checked="" type="checkbox"/> Pennsylvania
<input checked="" type="checkbox"/> Michigan	<input checked="" type="checkbox"/> Wisconsin
<input checked="" type="checkbox"/> Minnesota	<input checked="" type="checkbox"/> Ohio

Lakes:

<input type="checkbox"/> Superior	<input type="checkbox"/> Erie
<input type="checkbox"/> Huron	<input type="checkbox"/> Ontario
<input type="checkbox"/> Michigan	<input checked="" type="checkbox"/> All Lakes

Geographic Initiatives:

<input type="checkbox"/> Greater Chicago	<input type="checkbox"/> NE Ohio	<input type="checkbox"/> NW Indiana	<input type="checkbox"/> SE Michigan	<input type="checkbox"/> Lake St. Clair
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Primary Affected Area of Concern: All AOCs

Other Affected Areas of Concern:

For Habitat Projects Only:

Primary Affected Biodiversity Investment Area:

Other Affected Biodiversity Investment Areas:

Problem Statement:

Sediment remediation projects done in the United States to date have resulted in a wide range of unit costs (dollars per cubic yard) that are up to two orders of magnitude larger than the typical costs of dredging and disposing of contaminated sediments for navigational purposes. A decision framework and software tools are needed to identify economies of scale, trade-offs, and cost-, or production rate-compensating measures in order to bring some economy to the expensive business of sediment clean-up.

Proposed Work Outcome:

The intent of this work is to provide a decision framework, software tools and training that will help speed up and resolve decisions to remediate contaminated sediments in Great Lakes AOCs. The environmental outcome of this project should be more sediment cleanup projects completed, and completed faster than if the tools and training are not provided. The proposed work will extend and complement work done on a decision framework development project funded in 1995-1997 by the USEPA-GLNPO, the Great Lakes Protection Fund, and the University of Wisconsin Sea Grant College Program. A Framework Report has been written to document all funded work on the decision framework to date. The report includes descriptions of the REMSIM (REMediation SIMulation) software modules that most often characterize sediment remediation: site characterization, dredging, volume reduction (soil washing), disposal, and wastewater treatment. The Framework Report and a report on the software evaluations will be submitted with an invited proposal. The new, tightly-focused plan of work includes: a) validating and refining the software modules, b) developing a sediment conditioning module to improve input information for the wastewater treatment and disposal modules, c) developing connectivity between modules, and d) refining REMSIM as a user-friendly software product. Users of the framework and software will be helped to make decisions about sediment remediation, and to identify ways of reducing the costs of remediation.

Project Milestones:	Dates:
Project Start	08/2000
REMSIM Software Improvements Done	09/2001
REMSIM Software Validations Done	01/2002
Training Materials Drafted	01/2002
Testing of Training Materials Completed	04/2002
Framework Documentation Completed	08/2002
Training Sessions completed	08/2002
Project End	08/2002

☒ Project Addresses Environmental Justice

If So, Description of How:

Contaminated sediments in fish of the Great Lakes and its tributaries are a principal source of contamination in fish consumed by people living in the Great Lakes Basin. Native Americans and some recent immigrant groups such as the Hmong, living in proximity to these waters, tend to be quite active consumers of Great Lakes fish, relative to their proportions in the Great Lakes population. Understanding the risks of fish consumption and acting on that understanding is hindered by language and culture. The human health effects of eating contaminated fish fall disproportionately upon these groups. The proposed work on the decision framework and software is intended to help speed up sediment cleanup and help hasten the day when all Great Lakes fish are once again safe to eat. This proposed work seeks to correct an environmental injustice.

☒ Project Addresses Education/Outreach

If So, Description of How:

The demonstration/evaluation sessions held to date show that the primary audience for the framework and software is environmental resource managers, consulting engineers, and contractors planning and managing sediment remediation projects. The decision framework and software will help them to: a) plan projects more efficiently so that time saved can be focused on resolving uniquely site-specific issues, and b) efficiently examine trade-offs and compensating strategies to offset productivity limitations caused by project specifications or site conditions. Education and evaluation of training materials for the REMSIM software will begin as part of the annual University of Wisconsin-Madison short course on managing contaminated sediments. Training manuals will be revised through an iterative process of use at demonstration/training sessions, observation and revision. Education will continue in at least two training sessions to be held in selected Great Lakes cities. Outreach will rely heavily on help from a re-formed advisory committee made up of representatives from each of the Great Lakes states (except Indiana) and from the International Joint Commission staff. Outreach will also be done through state and regional chapters of professional associations and will include use of the Wisconsin Sea Grant web site, and the Great Lakes Information Network (GLIN).

Project Budget:

	Federal Share Requested (\$)	Applicant's Share (\$)
Personnel:	115,638	33,463
Fringe:	25,430	10,961
Travel:	17,000	0
Equipment:	0	0
Supplies:	7,000	0
Contracts:	15,000	0
Construction:	0	0
Other:	3,000	0
Total Direct Costs:	183,068	44,424
Indirect Costs:	80,550	19,547
Total:	263,618	63,971
Projected Income:	0	0

Funding by Other Organizations (Names, Amounts, Description of Commitments):

The Great Lakes Protection Fund is being asked to fund work to complete and extend the economic benefits methodology to other Great Lakes Areas of Concern, and to share costs of publishing, training, and disseminating software and a handbook. A total of \$251,271 is being requested from the GLPF for two years. The University of Wisconsin Sea Grant Program's matching funds will continue work invested in the software development by Wisconsin Sea Grant since the Phase I project funded by EPA-GLNPO, GLPF and Sea Grant, ended in August 1997.

Description of Collaboration/Community Based Support:

The U.S. section of the Advisory Committee that assisted in the funded first phase of the project will be reformed. Representatives from each of the Great Lakes states (except Indiana which does not participate in the Great Lakes Protection Fund) will be sought, as well as a staff person from the International Joint Commission in Windsor, Ontario. The advisory committee will have representatives from state regulatory agencies, consulting firms, other industry, and an environmental organization. The committee members will help decide: a) the final forms of the framework products and software, b) ways of reaching our identified audience, and c) how to make the decision framework available on the Internet. We will collaborate with one or more engineering consulting firms and contractors experienced in sediment remediation projects to help evaluate, validate, and demonstrate the usefulness of the REMSIM software to engineers and managers planning and/or managing sediment remediation projects around the Great Lakes. We will collaborate with the University's Department of Engineering Professional Development to offer tutorial and evaluation sessions to a national and international group of engineers who attend the annual, popular short course on managing contaminated sediments.